IPC Series

Analogue RGB input flat panel display

10.4inch

IPC-DT/M20V(PC)T

12.1inch

IPC-DT/L20S(PC)T

15inch

IPC-DT/H20X(PC)T

User's Manual

CONTEC CO.,LTD.

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FCC PART 15 Class A Notice

NOTE

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in commercial environment.
This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference at his own expense.

WARNING TO USER

Change or modifications not expressly approved the manufacturer can void the user's authority to operate this equipment.

Note!

To connect with peripherals, use a grounded, shielded cable.

Table of Contents

Copyright i
Trademarks i
FCC PART 15 Class A Notice i
Table of Contents ii

1.Introduction 1

Features 1
Limited One-Year Warranty 2
How to Obtain Service 2
Liability 2
Handling Precautions 3

2.Specifications 7

Function Specifications 7
General Specifications 9
Optical Display Specifications 10

3.Outside Dimensions and Part Names 11

Outside Dimensions 11
Part Names 14
Analog RGB Connector 15
RS Touch Panel Connector 15
USB Touch Panel Connector 16
Dip Switch 17
Backlight ON/OFF Connector 18

4.Setting the Display 19

Installation Requirements 19
Panel Cut 20
Attaching the Fitting Used to Attach to the Main Unit 22

5.Connection to the Host Computer 25

Analog RGB Connection 25
Touch Panel Data Communications 26

6.Power Supply Connection 27
Power Supply Connector 27
AC Adapter Jack 28
AC code removal prevention fitting 29
7.Screen Adjustment and a Setup 31
Menu Screen 31
Direct Key 36
Memory of a Setting Value 36
8.LED Indicators 37
9.Touch Panel 39
USB Multi-Touch Panel 41
10.Display Mode 43
11.Options 45

1. Introduction

This equipment is an analog RGB signal input, color TFT LCD for use in combination with a host computer such as the CONTEC IPC Series or single-board computer (SBC).

Features

- Full-bright, wide-angle-of-visibility type of liquid crystals capable of displaying up to 16,777,216 colors(15inch), 262,144 colors(10inch / 12.1inch)
- Standard analog RGB input for screen. RS-232C and USB interfaces for touch panel.
- Multiple touch panel configurations containing up to eight touch panels are supported when using the USB touch panel interface.
- Auto-scaling feature that resizes the input screen to the LCD dot configuration.
- On-screen display setup menu facilitating screen adjustment
- Analog touch panel enabling mouse emulation using driver software
- Input connector allowing external control of turning on/off the backlight
- Back-mounted, dedicated power supply unit [IPC-POA200/12-01] and AC adapter [IPC-ACAP12-01] available as an option, enabling the LCD to be used with an AC power supply
- Front structure with IP65-compliant ingress protection
- Optional stand kit for tabletop use

* For the host computer to be used with the display or its options, contact your local CONTEC branch or sales office.

Limited One-Year Warranty

CONTEC Interface boards are warranted by CONTEC CO., LTD. to be free from defects in material and workmanship for up to one year from the date of purchase by the original purchaser.

Repair will be free of charge only when this device is returned freight prepaid with a copy of the original invoice and a Return Merchandise Authorization to the distributor or the CONTEC group office, from which it was purchased.

This warranty is not applicable for scratches or normal wear, but only for the electronic circuitry and original boards. The warranty is not applicable if the device has been tampered with or damaged through abuse, mistreatment, neglect, or unreasonable use, or if the original invoice is not included, in which case repairs will be considered beyond the warranty policy.

How to Obtain Service

For replacement or repair, return the device freight prepaid, with a copy of the original invoice. Please obtain a Return Merchandise Authorization Number (RMA) from the CONTEC group office where you purchased before returning any product.

*** No product will be accepted by CONTEC group without the RMA number.**

Liability

The obligation of the warrantor is solely to repair or replace the product. In no event will the warrantor be liable for any incidental or consequential damages due to such defect or consequences that arise from inexperienced usage, misuse, or malfunction of this device.

Handling Precautions

Take the following precautions when handling this board.

- This display is made of the precise electric parts, so do not use or store it in the vicinity of impulse or vibration.
- This product is not intended for use in aerospace, space, nuclear power, medical equipment, or other applications that require a very high level of reliability. Do not use the product in such applications.
- If you utilize this product in such usages where high reliability and safety are required as on the trains, vessels, automotives or crime- or disaster-prevention devices, contact your retailer.
- Do not use or store the product in a location exposed to extremely high or low temperature or susceptible to rapid temperature changes.

  Example: - Exposure to direct sun
  - In the vicinity of a heat source
- Do not use the product in extremely humid or dusty locations.
- Do not perform key operations with the touch panel to implement a process that might endanger life or result in serious damages. Design a system that can cope with incorrect key input operations.
- Do not use a sharp-edged object, such as a mechanical pencil, to operate the touch panel in order to prevent scratching or malfunctions.
- Protect the touch panel against shock to prevent damage.
- CONTEC is not liable for a product that has been modified by the user.
- For this equipment, use the dedicated power supply unit if possible. If you connect any other power supply unit, be sure to select the one that satisfies the voltage and current capacity standards.
- Never supply power to the power supply connector and the AC adapter jack at the same time as it can cause a fault.
- When the surface or frame of the touch panel has become dirty, wipe it with neutral detergent. Do not wipe the touch panel with thinner, alcohol, ammonia, or a strong chlorinated solvent.

- Do not plug or unplug the connector with the equipment powered on. As doing so may result in a malfunction or fault.
- In the event of failure or abnormality, contact your retailer.

Use environment

This product operates under the following operating systems:
Windows XP/2000/NT 4.0/98SE/95OSR2, MS-DOS 6.2
* The touch panel USB interface is only supported on Windows XP/2000/98SE.

Life expectancy of components

(1) Backlight--- Display brightness decreases over time with use. The operating lifetime of the backlight is as follows. (The time until the brightness is lowered to 50% of the initial value. , Assuming continuous operation at 25 degrees centigrade.)
- IPC-DT/M20V(PC)T : 50,000 hours
- IPC-DT/L20S(PC)T : 50,000 hours
- IPC-DT/H20X(PC)T : 25,000 hours

(2) Touch panel--- The operating lifetime of the touch panel is at least 1 million touches (as tested by mechanical touching under 300g of force at a rate of two presses per second).

* CONTEC accepts your request for replacing each consumable in the PANECON-PC as a request for repair (at an additional cost). Contact your local retailer or CONTEC sales office.

LCD Display Pixel Drop

LCD display may have some pixels being dropped (bright and black spots) below a certain threshold. Note that this is not a failure or a defect.

Burn-in on TFT Display

"Burn-in" may occur if the same display is retained for a long time. Avoid this by periodically switching the display so that the same display is not maintained for a long time.

* Burn-In: Phenomenon characterized by a TFT display as a result of long-time display of the same screen where a shadow-like trace persists because electric charge remains in the LCD element even after the patterns are changed.

Connecting to a host with an existing touch panel function such as a CONTEC panel computer.

The touch panel cannot be used together with the built-in touch panel on the computer. In this case, the touch panel on the screen cannot be used (although display operation is still available.)
However, on the following CONTEC panel computers, multiple touch panels can be used together when connected via the USB interface.

- IPC-PT/600 Series IPC-PT/x6x0x(PCW)x

2. Specifications

Function Specifications

Table 2.1. Function Specifications *< 1 / 2 >*

Item			Specification		
			IPC-DT/M20V(PC)T	IPC-DT/L20S(PC)T	IPC-DT/H20X(PC)T
Screen					
	Assembly type		Panel mounted *1		
	Screen size		10.4 inches	12.1 inches	15 inches
	Number of pixels		640 x 480 dots	800 x 600 dots	1024 x 768 dots
	Display type		TFT Color LCD		
	Number of colors		262,144 colors	262,144 colors	16,777,216 colors
	Screen adjustment		Automatic adjustment (display positioning and scaling) and manual adjustment using the front switches		
	Brightness control		Adjustment using the front switch or software control from the host computer		
	Backlight control		Adjustment using the front switch, software control from the host computer, or ON/OFF control via the rear-panel connector input		
	Display interface		Analog RGB input HD-SUB 15 pin (Female) connector		
	Cable length which recommends		5mm or less *2		
	Incoming signal specification	Picture signal	RGB separation, Analog, Positive polarity 0.7Vp-p/75Ω		
		Synchronized signal	V/H separation, TTL, Positive / negative polarity		
		Horizontal scan frequency	31 - 38kHz	31 - 48kHz	31 - 60kHz
		Vertical scan frequency	60 - 72Hz	56 - 72Hz	56 - 75Hz
Touch panel					
	Resolution		4096 x 4096		
	Detection method		Resistive-layer analog method		
	Touch life expectancy		One million repeated touches (silicon rubber load of 3 N)		
	Touch panel interface		Connect to the host computer using either USB*3 or RS-232C. USB: USB1.1-compliant, TypeB Connector RS-232C: 9pin D-SUB (Male) Connector		
	Touch panel driver (Option)		Windows : IPC-SLIB-01 MS-DOS : IPC-TPB1-DRV		

Table 2.1. Function Specifications < 2 / 2 >

Item		Specification		
		IPC-DT/M20V(PC)T	IPC-DT/L20S(PC)T	IPC-DT/H20X(PC)T
Power supply input part				
	Power supply connector	4-pin nylon connector for 12 VDC power supply (Back-mounted, power supply unit [IPC-POA200/12-01] available as an option, enabling input at 85 - 264 VAC)		
	AC adapter jack	AC adapter jack for 12 VDC power supply (Power supply unit [IPC-ACAP12-01] available as an option, enabling input at 100 - 240 VAC)		
	Input power supply voltage	DC+12V±5%		
	Power consumption	1.3A(Max.)	1.6A(Max.)	1.8A(Max.)
	Power consumption (power save mode)	0.2A(Max.)		

*1 Optional desk stand IPC-SND-03 allowing desktop installation.

*2 Using a cable longer than 5 m may reduce the image quality. The cable should be as short as possible as degradation in image quality may result even when the cable is 5 m or shorter depending on the type of host computer or cable.

*3 The touch panel USB interface is only supported on Windows XP/2000/98SE.

General Specifications

Table 2.2. General Specifications

Condition			Specification		
			IPC-DT/M20V(PC)T	IPC-DT/L20S(PC)T	IPC-DT/H20X(PC)T
Environment					
	Operating temperature		0 - 50ºC (0 - 40ºC when using an IPC-ACAP12-01 (AC switching adapter))		
	Storage temperature		-10 - 60ºC		
	Operating humidity		10 - 90%RH (20 - 80% when using an IPC-ACAP12-01 (AC switching adapter)) (No condensation allowed)		
	Floating dust		Normal		
	Corrosive gas		None		
	Noise resistance	Line noise	AC line: 2 kV, Signal line: 1 kV (IEC1000-4-4Level3, EN61000-4-4Level3) (HOST: IPC-BX/M600(PCW) Power supply: IPC-POA200/12-01)		
		Electrostatic withstanding voltages	Contact: 4 kV(IEC1000-4-2Level2, EN61000-4-2Level2) Airborne: 8 kV(IEC1000-4-2Level3, EN61000-4-2Level3) (HOST: IPC-BX/M600(PCW) Power supply: IPC-POA200/12-01)		
	Vibration resistance	Sweep durability	10 - 50 Hz/Single-side amplitude or 0.15 mm 50 - 500 Hz/2.0 G in the X/Y/Z directions for 23 minutes each (Conforming to JIS C0040 and IEC68-2-6)		
		Fixed-vibration durability	16.7 Hz/2 G in the X/Y/Z directions for 30 minutes each (Conforming to JIS C0040 and IEC68-2-6)		
	Shock resistance		10 G in the X/Y/Z directions for 11 ms; Half-sine wave (Conforming to JIS C0041 and IEC68-2-27)		
Structure					
	Major dimensions (mm)		317(W) x 44(D) x 277(H)	370(W) x 48(D) x 307(H)	428(W) x 48(D) x 336(H)
	Panel cut dimensions (mm)		292±0.5(W) x 252±0.5(H)	344±0.5(W) x 281±0.5(H) (12 stud holes are required on the periphery.)	398±0.5(W) x 306±0.5(H) (12 stud holes are required on the periphery.)
	Mountable panel thickness		10 mm or less		
	Weight		3.5kg	4.4kg	5.5kg
	Ingress protection		Front part conforming to IP65		

Optical Display Specifications

Table 2.3. Optical Display Specifications

Item	Condition			Specifications (25ºC Typ. value)		
				IPC-DT/M20V(PC)T	IPC-DT/L20S(PC)T	IPC-DT/H20X(PC)T
Visual angle (vertical)	CR≥10	ϕ = 180°	Display in monochrome	40deg	50deg	45deg
		ϕ = 0°		70deg	70deg	55deg
Visual angle (horizontal)		ϕ = +90°		70deg	70deg	60deg
		ϕ= -90°		70deg	70deg	60deg
Surface brightness (at center)	Display in white			350cd/m^2 (Typ.)	350cd/m^2 (Typ.)	250cd/m^2

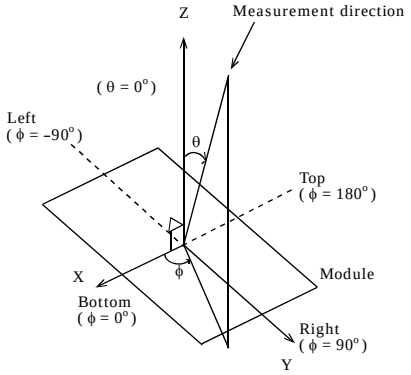


Figure 2.1. Viewing Range Definition

Note!

The above optical specification data shows optical characteristics of the liquid crystal in the display; the data does not represent the actual view on the display or its viewing angles

3. Outside Dimensions and Part Names

Outside Dimensions

IPC-DT/M20V(PC)T

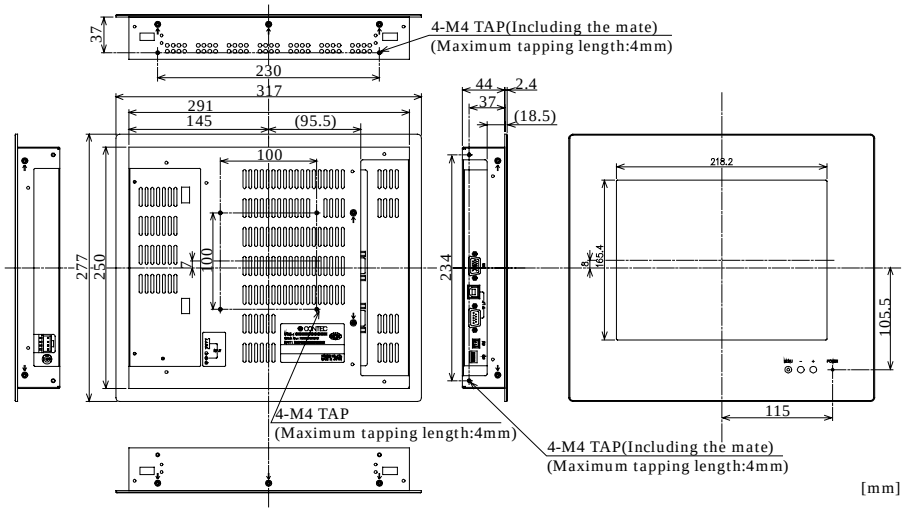


Figure 3.1. Outside Dimensions of Main Unit (IPC-DT/M20V(PC)T)

IPC-DT/L20S(PC)T

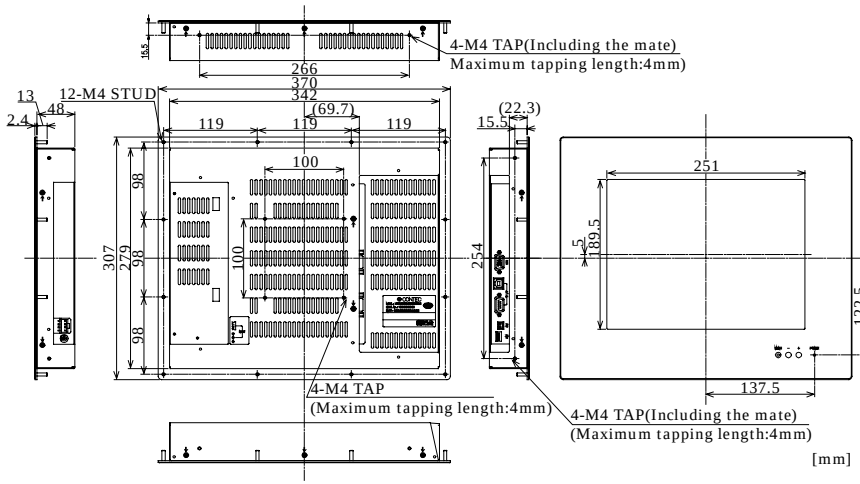


Figure 3.2. Outside Dimensions of Main Unit (IPC-DT/L20S(PC)T)

IPC-DT/H20X(PC)T

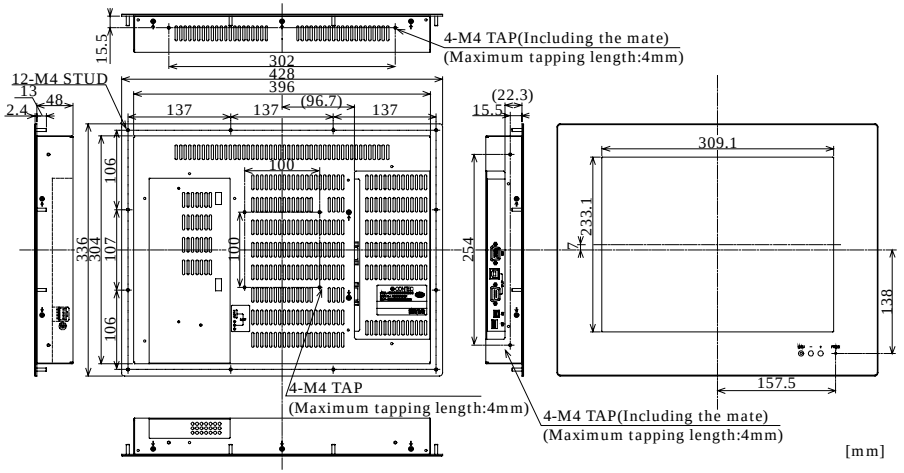


Figure 3.3. Outside Dimensions of Main Unit (IPC-DT/H20X(PC)T)

IPC-DT/M20V(PC)T with IPC-POA200/12-01 (power supply unit)

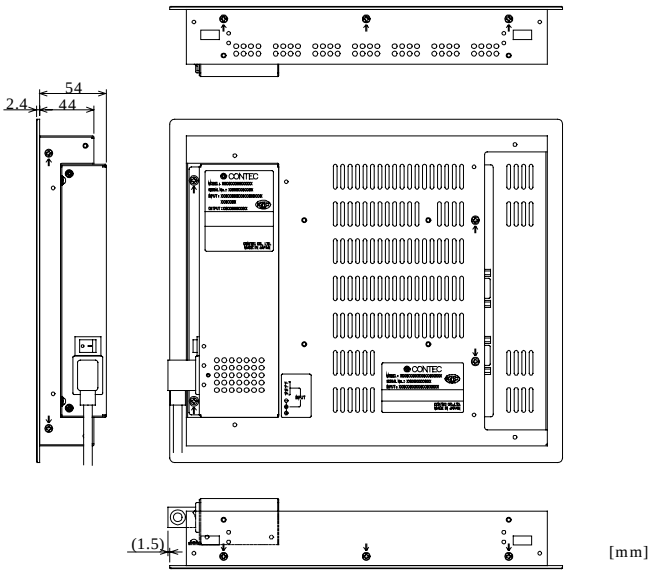


Figure 3.4. Dimensions of IPC-DT/M20V(PC)T with IPC-POA200/12-01

IPC-DT/L20S(PC)T with IPC-POA200/12-01 (power supply unit)

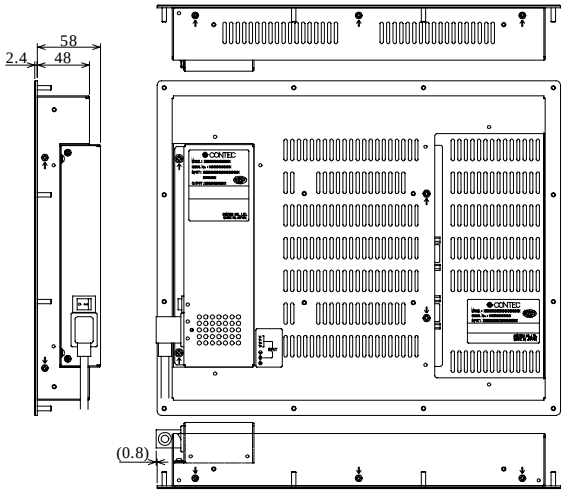


Figure 3.5. Dimensions of IPC-DT/L20S(PC)T with IPC-POA200/12-01

IPC-DT/H20X(PC)T with IPC-POA200/12-01 (power supply unit)

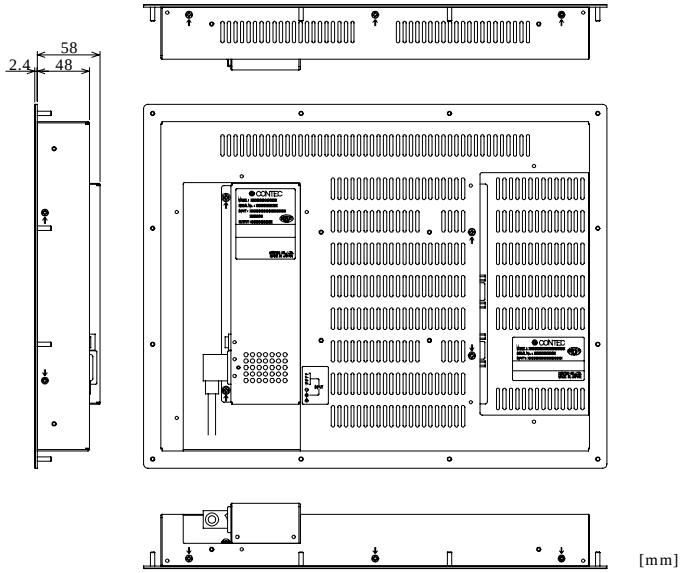


Figure 3.6. Dimensions of IPC-DT/H20X(PC)T with IPC-POA200/12-01

Part Names

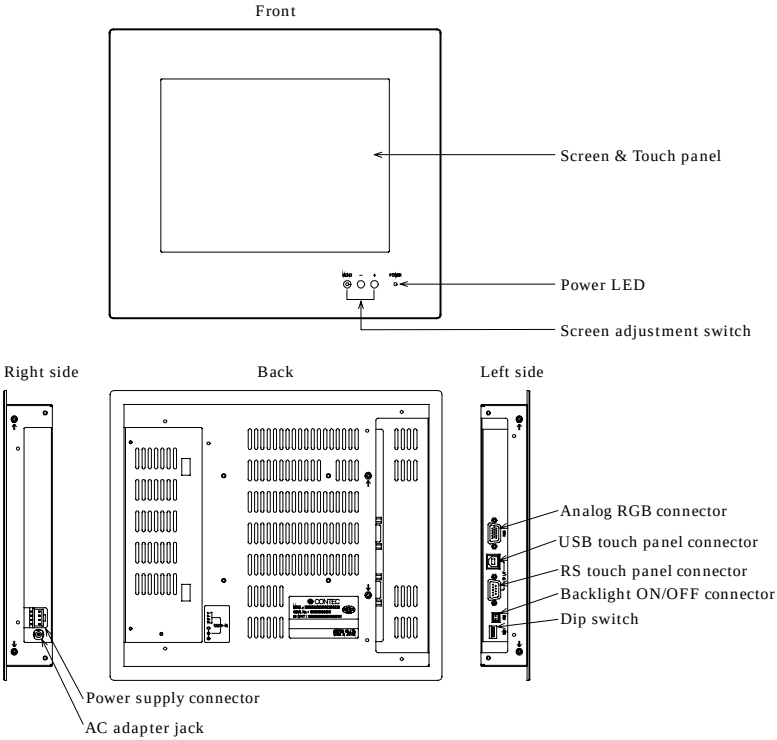


Figure 3.7. Part Names

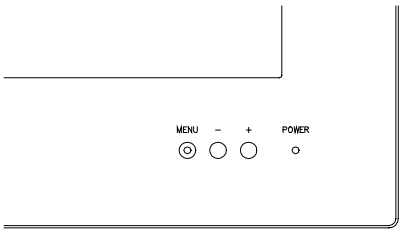
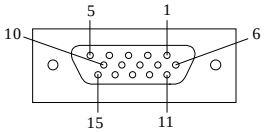


Figure 3.8. Screen Adjustment Switch

Analog RGB Connector

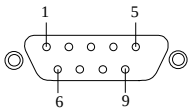
Table 3.1. Analog RGB Connector

Connector type	HD-SUB 15pin (FEMALE)		
			
Pin No.	Signal name	Pin No.	Signal name
1	RED	9	N.C.
2	GREEN	10	GND
3	BLUE	11	N.C.
4	N.C.	12	DDC DATA
5	GND	13	HSYNC
6	R-GND	14	VSYNC
7	G-GND	15	DDC CLK
8	B-GND		

RS Touch Panel Connector

This connector is RS-232C compliant to be used for touch panel data communication with the host computer.

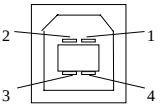
Table 3.2. RS Touch Panel Connector

Connector type	D-SUB 9pin (MALE)		
			
Pin No.	Signal name	Pin No.	Signal name
1	N.C.	6	Reserved
2	TxD	7	N.C.
3	RxD	8	N.C.
4	Reserved	9	N.C.
5	GND		

USB Touch Panel Connector

The USB connector for communication between the host computer and touch panel.

Table 3.3. USB Touch Panel Connector

Connector type	USB Type B (Receptacle)		
			
Pin No.	Signal name	Pin No.	Signal name
1	+5V	3	DATA+
2	DATA-	4	GND

Dip Switch

A DIP switch is located on the left side of the unit.
Switches 1 - 3 are used as the ID setting when connecting multiple touch panels via USB. See Chapter 9 for details on connecting multiple touch panels via USB.

Notes!

- *When connecting via RS-232C or a single USB connection, set switches 1 - 3 to OFF. (The default factory setting)*
- *Ensure that the power is turned OFF before changing the DIP switch settings.*

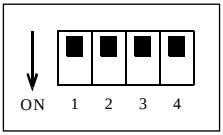


Figure 3.9. Dip Switch

Table 3.4. Setting a Dip Switch

No.	Setting	Setting description	Factory setting
1	USBID0	Setting the USB touch panel ID	OFF
2	USBID1	Setting the USB touch panel ID	OFF
3	USBID2	Setting the USB touch panel ID	OFF
4	Reserved	Reserve (Leave this at OFF.)	OFF

The USB ID0, 1 and 2 settings specify the ID when connecting multiple touch panels via USB.

Table 3.5. Setting a USB ID

USB ID	USBID0	USBID1	USBID2
7	OFF	OFF	OFF
6	ON	OFF	OFF
5	OFF	ON	OFF
4	ON	ON	OFF
3	OFF	OFF	ON
2	ON	OFF	ON
1	OFF	ON	ON
0	ON	ON	ON

Backlight ON/OFF Connector

The equipment has a backlight ON/OFF connector on the back. Given below are the pin assignment of the connector and its applicable example.

Table 3.6. Remote Control Cable Connector

Connector type	S2B-XH-A(manufactured by JST)
Pin1-2	Function
Open	Backlight ON
Short	Backlight OFF

Connector Applicable Example

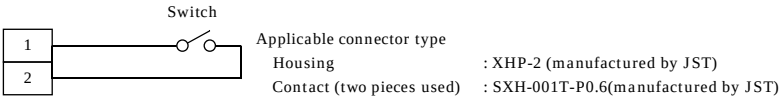


Figure 3.10. Connector Applicable Example

Notes!

- *The connection cable is not bundled with this product; it must be prepared by the user.*
- *Backlight ON/OFF control can be implemented by means of software from the host computer.*
  However, do not use this software at the same time as the backlight control on the connector.

4. Setting the Display

Installation Requirements

To maintain the ambient temperature within the installation environment requirement range, provide a gap of 30mm or more between the main unit and any adjacent equipment.

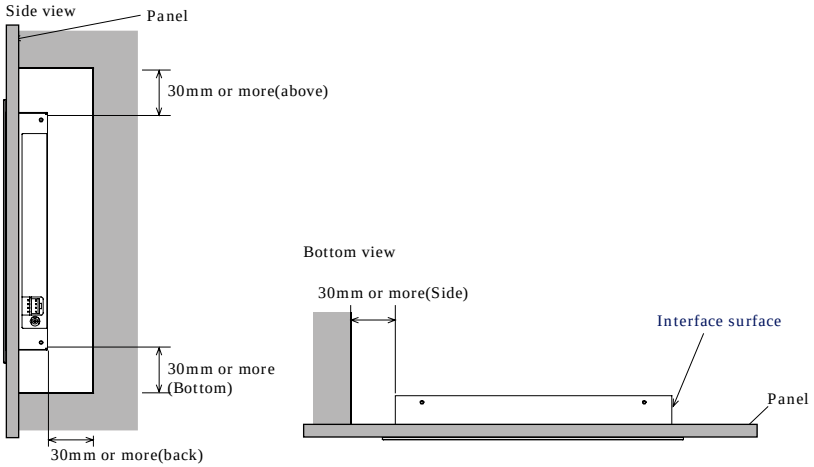


Figure 4.1. Distances between the FPD and Its Vicinity

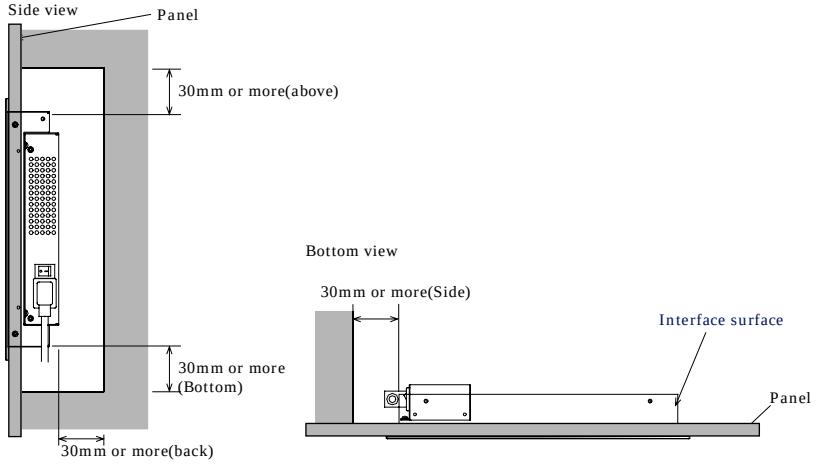


Figure 4.2. Distances between the FPD and Its Vicinity (with Power Supply Unit IPC-POA200/12-01)

Panel Cut

Cut the display mount panel in the following dimensions. The four corners of the solid-line rectangle define the panel cut dimensions.

IPC-DT/M20(PC)T does not need the stud holes because panel can be attached by using the fitting(bundled). For the IPC-DT/L20S(PC)T and IPC-DT/H20X(PC)T, stud holes must be drilled in the panel cut periphery. The holes (12 holes) on dashed lines below represent the stud holes.

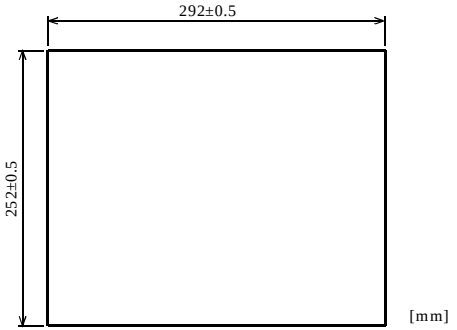


Figure 4.3. IPC-DT/M20V(PC)T [10.4inch] Panel Cut Dimensions

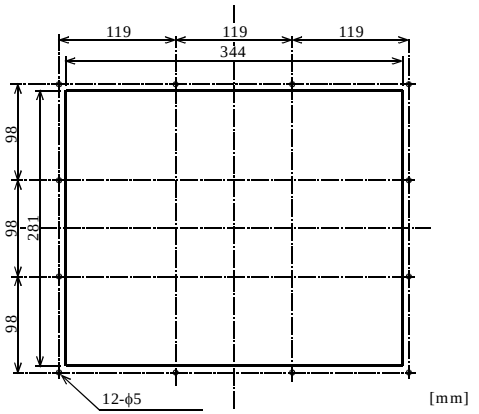


Figure 4.4. IPC-DT/L20S(PC)T [12.1inch] Panel Cut Dimensions and Stud Hole Positions

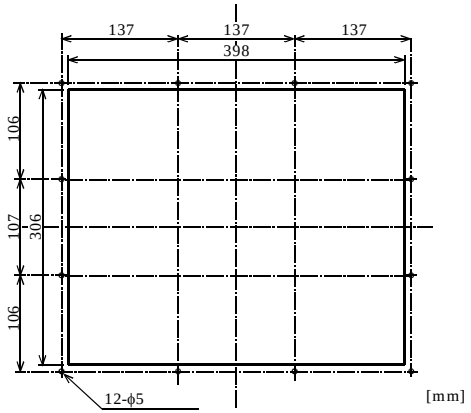


Figure 4.5. IPC-DT/H20X(PC)T [15inch] Panel Cut Dimensions and Stud Hole Positions

Attaching the Fitting Used to Attach to the Main Unit

IPC-DT/M20V(PC)T

1. Hold the main unit from the outside of the panel.

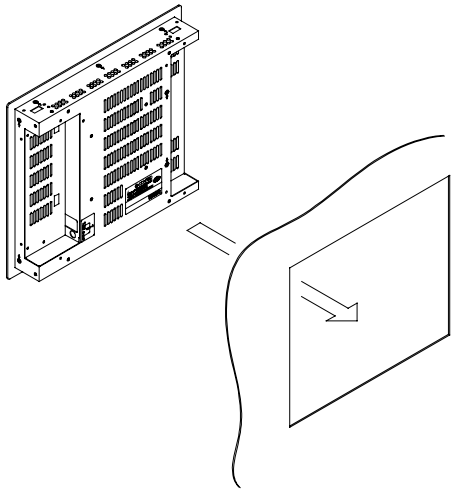


Figure 4.6. Attaching the Fitting Used to Attach to the Main Unit *< 1 / 4 >*

2. Hold the attach from the inside of the panel.

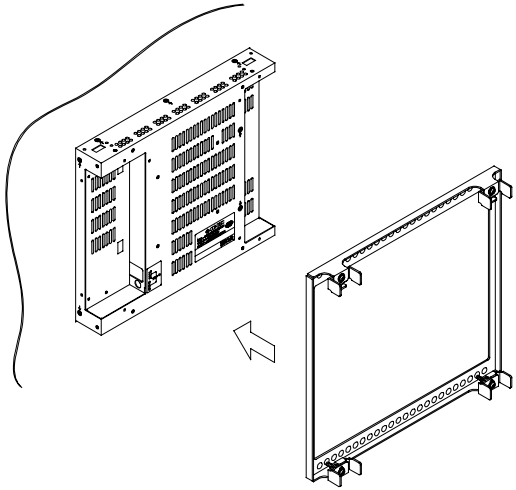


Figure 4.6. Attaching the Fitting Used to Attach to the Main Unit *< 2 / 4 >*

3. Undo the four screws. (Approximately 10 turns for a 2mm thick panel.)
4. Clip the pawl on the sliding part of the attachment fitting into the hexagonal hole in the main unit.

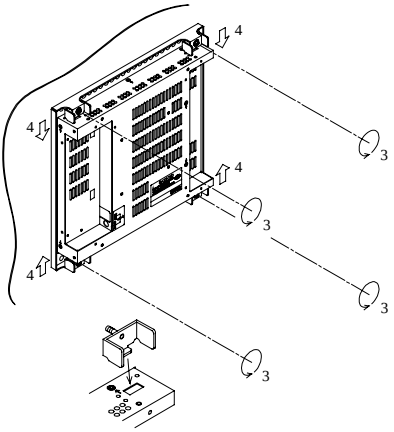


Figure 4.6. Attaching the Fitting Used to Attach to the Main Unit *< 3 / 4 >*

5. Re-tighten the four screws.

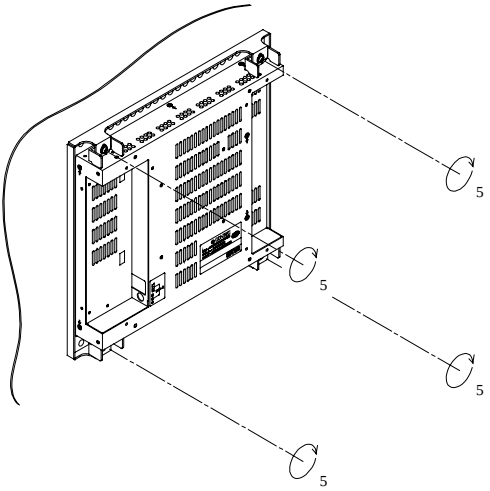


Figure 4.6. Attaching the Fitting Used to Attach to the Main Unit *< 4 / 4 >*

IPC-DT/L20S(PC)T, IPC-DT/H20X(PC)T

Attach the display to the panel with a waterproof gasket (packing) inserted in between, apply M4 nuts to the studs (12 positions) out through the panel, then tighten the nuts to fasten the panel and the display together.

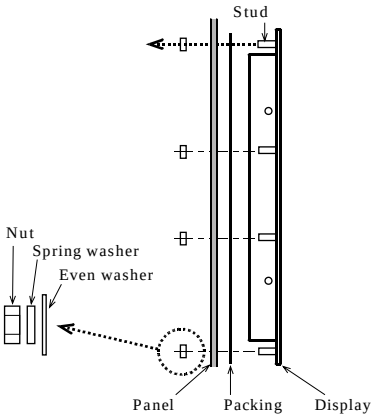


Figure 4.7. Attachment to IPC-DT/L20S(PC)T or IPC-DT/H20X(PC)T

Note!

The maximum mountable panel thickness is 10 mm for each model.

5. Connection to the Host Computer

Purchase individual connection cables as they are not bundled with this equipment.

Analog RGB Connection

This connection inputs analog RGB display signals to the equipment. Connect the cable to the analog RGB connector on the host computer.

Table 5.1. Recommendation Display Cable

Model	Maker	Cable length
KC-V2	SANWA SUPPLY INC.	2m
KC-V5	SANWA SUPPLY INC.	5m

If you use any other cable, select a shielded cable the wire carrying the RGB and H/Vsync signals and the grounded wire in a twisted pair. Note that a non-twisted-pair cable may degrade image quality, in particular, which is longer than 2 m.

Touch Panel Data Communications

These connections are used to send touch panel data to the host computer via the USB or RS-232C serial port. Connect to the USB port or serial port (COM port) on the host computer.

Table 5.2. Example of a USB connection cable (USB Type A(Host) ⇔ Type B(Display)cable)

Model	Maker	Cable length
KU20-2H	SANWA SUPPLY INC.	2m
KU20-5H	SANWA SUPPLY INC.	5m

Table 5.3. Option Cable (RS-232C Straight Cable)

Model	Maker	Cable length
IPC-CBL3-2	CONTEC	2m
IPC-CBL3-5	CONTEC	5m

Notes!

- *Touch panel driver software is required to use the touch panel. Purchase optional driver software [IPC-SLIB-01 for windows] or download one from the CONTEC's web site (http://www.contec.co.jp/download/).*
- *The USB touch panel driver software requires V1.20 or later of IPC-SLIB-01.*
- *The USB connection can only be used on Windows XP, 2000, or 98SE. Connect via the RS-232C interface if using a different OS.*
- *Use either USB or RS-232C for connecting the touch panel. The touch panel cannot be connected via both interfaces at the same time.*
- *When using the USB connection, the screen image may disappear momentarily when the USB cable is connected or disconnected and when the computer power is turned ON or OFF.*
- *When using the USB connection via a hub, the unit may not operate correctly in some cases depending on the other USB devices connected to the hub. Please check the operation before using in practice.*

6. Power Supply Connection

This equipment requires power supply at +12 VDC to operate.
For power supply, it has the power connector and the AC adapter jack.

Notes!

- *Connect a power supply to either of the power connector and adapter jack. Never supply power to both of them at the same time as it can cause a fault.*
- *If you connect a power supply other than the option, be sure to take safety measures for the power supply, such as overvoltage protection. Use meticulous care not to mistake the connection polarity or voltage of the power supply as it may break the equipment, the power supply, or both.*

Power Supply Connector

The AC power supply unit [IPC-POA200/12-01] available as an option can be connected.
You connect a power supply other than the option, be sure to use the one that satisfies the following requirements:

- Power supply voltage: +12VDC 5%
- Power supply capacity: 2.5A or more

The table below lists the pin specifications of the power connector on the back of the equipment.

Table 6.1. Power Supply Connector

Connector type	+12 VDC input connector
Model	B4PS-VH(manufactured by JST)
Pin No.	Signal name
1	GND
2	GND
3	+12V
4	+12V

Applicable power cable connector
Housing: VHR-4N (manufactured by JST)
Contact: SVH-21T-1.1(AWG22-18)
(manufactured by JST)

* To use a power supply other than the optional AC power supply unit, prepare a cable connector separately.

AC Adapter Jack

The AC adapter jack is used to connect the AC adapter [IPC-ACAP12-01] available as an option.
Do not connect any AC adapter other than the option.

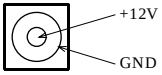


Figure 6.1. AC Adapter Jack

AC code removal prevention fitting

(1) When using the AC Adapter

1. Insert the plug of AC Adapter.
2. Tighten the screws on the attachment fitting.

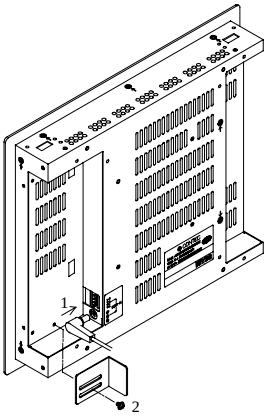


Figure 6.2. Code Removal Prevention Fitting (AC Adapter) *< 1 / 2 >*

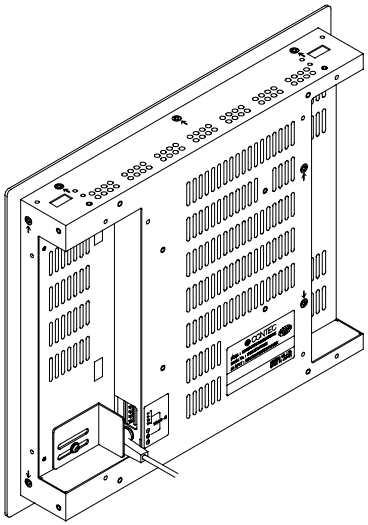


Figure 6.2. Code Removal Prevention Fitting (AC Adapter) *< 2 / 2 >*

(2) When using the dedicated power supply unit

1. Insert the AC cable.
2. Tighten the screws on the attachment fitting.

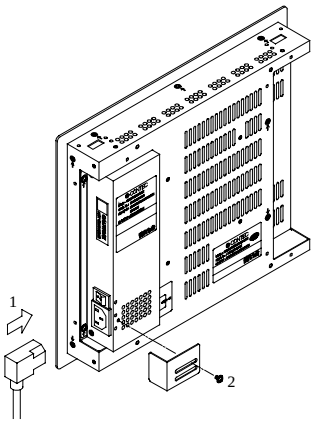


Figure 6.3. Code Removal Prevention Fitting (Dedicated Power Supply Unit) < *1 / 2* >

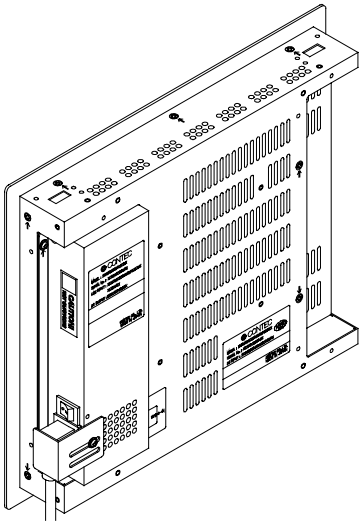


Figure 6.3. Code Removal Prevention Fitting (Dedicated Power Supply Unit) < 2 / 2 >

7. Screen Adjustment and a Setup

The equipment has screen adjustment switches [MENU], [+], and [-]. Use these switches to adjust the screen. (For the locations of the switches, see “Outside Dimensions and Part Names” in Chapter 3.)
When using the equipment for the first time or after changing the output screen mode of the host computer, execute AUTO ADJUST first on the menu screen. Use these switches also to adjust the screen brightness and contrast and to make settings for the touch panel.

Menu Screen

Pressing the [MENU] switch displays the main menu screen. Use the [+] and [-] switches to select individual items, adjust them, then press the [MENU] to save the settings.

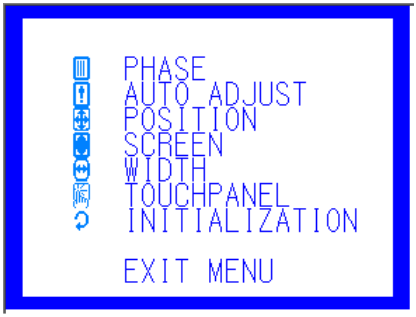


Figure 7.1. Main Menu Screen

PHASE : Adjust this item when the screen is partly blurred or flickering. Press [+] or [-] while checking the screen to optimize the item.

AUTO ADJUST: Select AUTO ADJUST when using the equipment for the first time or when the screen cannot be displayed normally due to a change made to the display mode. Select this item and press [MENU] to accept your selection, and the equipment starts performing automatic adjustment.

Note!

AUTO ADJUST may fail to adjust the screen correctly depending on the host computer or the display screen (mostly black screen such as in the DOS text mode). In such a case, adjust POSITION and WIDTH to manually optimize the screen.

POSITION : Even when AUTO ADJUST fails to position the screen correctly, you can adjust the horizontal and vertical positions of the display screen. Select this item to invoke the submenu, select a desired item using [+] or [-], then press [MENU] to accept the setting made.

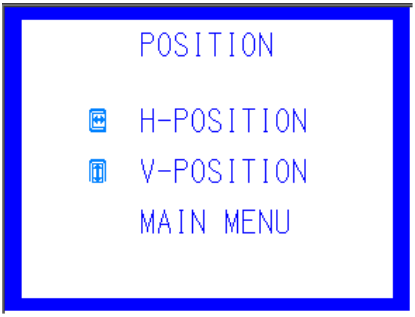


Figure 7.2. POSITION Submenu

H-POSITION: Select this item to adjust the horizontal position of the screen. Press [+] or [-] while checking the screen to optimize the item.

V-POSITION: Select this item to adjust the vertical position of the screen. Press [+] or [-] while checking the screen to optimize the item.

MAIN MENU: Select this item to return to the main menu.

SCREEN : Select this item to adjust the display status of the screen. Select this item to invoke the submenu, select a desired item using [+] or [-], then press [MENU] to accept the setting made.

Figure 7.3. SCREEN Submenu

CONTRAST : Select this item to adjust the contrast of the screen. Press [+] or [-] to optimize the item.

BRIGHTNESS: Select this item to adjust the brightness of the backlight. Press [+] or [-] to optimize the item. The brightness can also be adjusted by pressing the [+] and [-] keys without the MENU screen displayed, as the direct brightness control keys.

MAIN MENU: Select this item to return to the main menu.

WIDTH : Select this item to adjust the horizontal display size of the screen. Press [+] or [-] to optimize the item.

TOUCHPANEL: Select this item to adjust the status of the touch panel. Select this item to invoke the submenu, select a desired item using [+] or [-], then press [MENU] to accept the setting made.

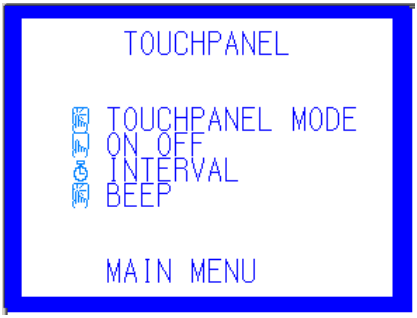


Figure 7.4. TOUCHPANEL Submenu

TOUCHPANEL MODE:
Select the touch panel mode (WINDOWS or DOS) depending on the host OS. For use in the MS-DOS environment (using the MS-DOS touch panel driver), be sure to set this item to “DOS”. (Factory setting:WINDOWS)

ON OFF : Select this item to turn ON (enable) or OFF (disable) the touch panel operation.
(The equipment is started always with this item set to OFF.)
Usually, this item does not have to be set as the touch panel is turned ON (enabled) automatically upon startup of the touch panel driver. Note, however, that the touch panel does not work when the equipment is connected to the host with the touch panel driver already up and running or when the power to the equipment is recycled. In such cases, set this item to ON (enabled).

INTERVAL : Select this item to adjust the scan timing of the touch panel. Press [+] or [-] to increase or decrease the response of the touch panel. (Factory setting:10)

BEEP : Select this item to turn on or off the click tone of the touch panel. (Factory setting:OFF) ON/OFF setting on the touch panel driver (host side) is also available. See also the driver setting when you change the setting.

MAIN MENU: Select this item to return to the main menu.

INITIALIZATION:

Select this item to reset all items to the factory defaults. If the screen has become blank or displayed abnormally, use this item to initialize the equipment. The initialization is executed by selecting “YES” and pressing [MENU]. It can also be executed by turning on the equipment while holding down the [MENU] key as the direct initialization key.

Direct Key

BRIGHTNESS : The brightness of the backlight can be adjusted by pressing the [+] and [-] keys without the menu screen displayed.

INITIALIZATION: All the settings can be reset to the factory defaults by turning on the equipment while holding down the [MENU] key.

Power save mode: You can place the equipment in the power save mode by depressing both of the [+] and [-] keys at the same time without the menu screen displayed. This can force the screen display and backlight to be turned off.
Release the buttons when "!POWERSAVE MODE" appears on the screen.
You can recover the screen from the power save mode by pressing any of the front switches. The power consumption of the equipment in the power save mode is about 1/5 of that during normal operation. Turning off the backlight when not required the backlight to extend its life.

* Recycling the power to the equipment in the power save mode recovers it to the normal display state.
* The POWER LED on the front face remains blinking in green in the power save mode.

Memory of a Setting Value

The equipment retains its settings even when the power is turned off.

Note, however, that the following settings are reset to their defaults without being retained.

- The power save mode setting made by the direct key is reset to the normal state when the power is turned on.
- The TOUCH PANEL ON/OFF setting is set to OFF when the power is turned on.

8. LED Indicators

The POWER LED on the front face indicates each state of the display as follows:

Table 8.1. LED Indicators

LED status	Description
OFF	The power supply off or the equipment not started normally
Green(ON)	Normal operation
Green(Flashing)	Power save mode
Orange(Flashing)	Unsupported signal input *1
Orange(Flashing)	No signal input *2

*1 The LED looks like this when the equipment cannot process the input signal to provide normal display, for example, when the horizontal/vertical sync signal frequency is exceeding the supported frequency.

See Chapter 10 "Display mode" for the display modes supported by this equipment.

*2 The LED looks like this also when the horizontal or vertical sync signal is turned off by the power management function of the host computer. The equipment enters the power save mode automatically when no signal has been input for about two seconds.

9. Touch Panel

This equipment has a touch panel that enables keyboard-less, mouse-less operations by communication with the host computer using the RS-232C cable.

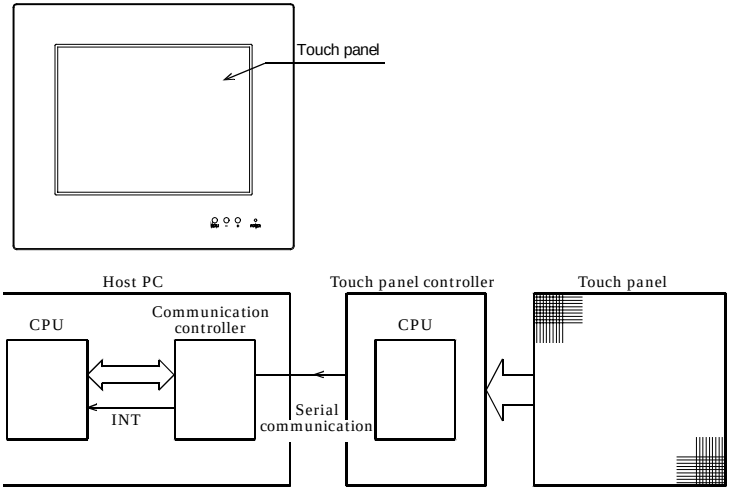


Figure 9.1. Touch Panel and Block Diagram

Data input at the touch panel is processed by the touch panel controller and passed to the host PC via the serial port on the CPU in the controller.

Before the touch panel can be used, touch panel driver software must be installed. Note that the driver software is not bundled with this product. Purchase the one separately or download it from the CONTEC's web site.

For further details, refer to the READ_ME file for each driver.

< Option touch panel driver >

Windows 95OSR2/98/2000/NT 4.0 : IPC-SLIB-01

Notes!

- *The USB touch panel driver software requires V1.20 or later of IPC-SLIB-01.*
- *The USB connection can only be used on Windows XP, 2000, or 98SE. Connect via the RS-232C interface if using a different OS.*
- *Use either USB or RS-232C for connecting the touch panel. The touch panel cannot be connected via both interfaces at the same time.*
- *When using the USB connection, the screen image may disappear momentarily when the USB cable is connected or disconnected and when the computer power is turned ON or OFF.*

USB Multi-Touch Panel

This function can be used in the case when the RGB signal from the host computer is split for connecting to multiple displays via a splitter. The function permits touch panel operation to be used at all the displays. A maximum of eight touch panel displays can be connected.

Note that all touch panels must be connected via USB and, to allow the touch panel driver software on the host computer to identify each device, a different USB ID must be set on the DIP switch located on the side of each display unit.

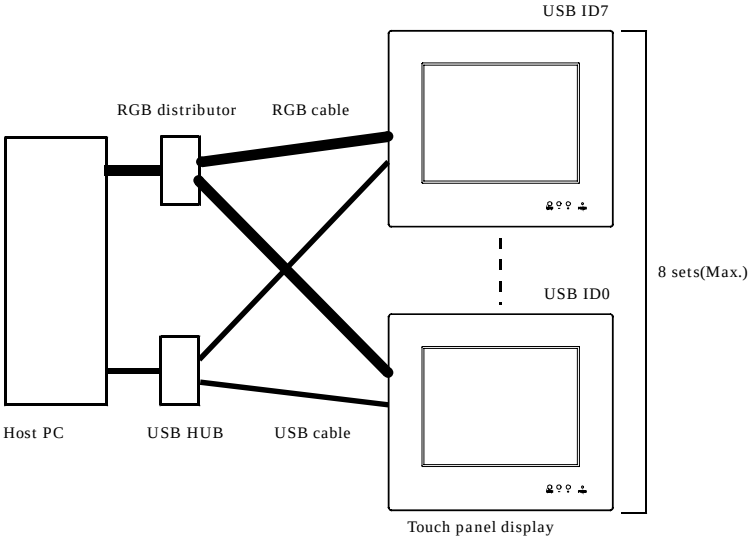


Figure 9.2. Example of connection of a USB multi-touch panel

You can use a CONTEC IPC-PT/600 series panel computer as the host PC.
In this case, the ID of the touch panel in the panel computer is fixed at ID7. Set the IDs of the external displays in the range USB ID0 - USB ID6 (a maximum of seven external displays can be connected).

Note!

You cannot use multiple touch panels via the RS-232C interface.

10. Display Mode

This equipment supports the following display modes:

Table 10.1. IPC-DT/M20V(PC)T

Video mode	Number of pixels (dot)	Dot clock (MHz)	Horizontal frequency (kHz)	Vertical frequency (Hz)	
VGA	640 x 350	25.18	31.47	70	*1, *2
VGA	640 x 400	25.18	31.47	70	
VGA	640 x 480	25.18	31.47	60	
VESA	640 x 480	31.50	37.86	72	

Table 10.2. IPC-DT/L20S(PC)T

Video mode	Number of pixels (dot)	Dot clock (MHz)	Horizontal frequency (kHz)	Vertical frequency (Hz)	
VGA	640 x 350	25.18	31.47	70	*1, *2
VGA	640 x 400	25.18	31.47	70	
VGA	720 x 400	28.32	31.47	70	*2
VGA	640 x 480	25.18	31.47	60	
VESA	640 x 480	31.50	37.86	72	
VESA	800 x 600	36.00	35.16	56	
VESA	800 x 600	40.00	37.88	60	
VESA	800 x 600	50.00	48.08	72	

Table 10.3. IPC-DT/H20X(PC)T

Video mode	Number of pixels (dot)	Dot clock (MHz)	Horizontal frequency (kHz)	Vertical frequency (Hz)	
VGA	640 x 350	25.18	31.47	70	*1, *2
VGA	640 x 400	25.18	31.47	70	
VGA	720 x 400	28.32	31.47	70	*2
VGA	640 x 480	25.18	31.47	60	
VESA	640 x 480	31.50	37.86	72	
VESA	640 x 480	31.50	37.50	75	
VESA	800 x 600	36.00	35.16	56	
VESA	800 x 600	40.00	37.88	60	
VESA	800 x 600	50.00	48.08	72	
VESA	800 x 600	49.50	46.88	75	
VESA	1024 x 768	65.00	48.36	60	
VESA	1024 x 768	75.00	56.48	70	
VESA	1024 x 768	78.75	60.02	75	

*1 The vertical display size does not reach the full-screen display size.

*2 Since the aspect ratio is not 4:3, the screen display is extended vertically.

Notes!

- *The number of display pixels of the LCD is 640 x 480 dots on the IPC-DT/M20V(PC)T, 800 x 600 dots on the IPC-DT/L20S(PC)T, and 1024 x 768 dots on the IPC-DT/H20X(PC)T. When the input has a resolution lower than the number of display pixels of each model, the screen display is enlarged automatically. Note, in this case, that the display quality is therefore degraded in clearness compared to the screen displayed at the resolution that matches the number of display pixels of the LCD.*
- *The equipment cannot provide normal display at a resolution or frequency other than the supported display modes.*

11. Options

Double-sided screen protective sheets

- IPC-CV : 10-inch [IPC-DT/M20V(PC)T] screen protective sheets (10 sheets)
- IPC-CV12 : 12.1-inch [IPC-DT/L20S(PC)T] screen protective sheets (10 sheets)
- IPC-CV15 : 15-inch [IPC-DT/H20X(PC)T] screen protective sheets (10 sheets)

Optional cables

- IPC-CBL3-2 : RS-232C cable for touch panels (2m)
- IPC-CBL3-5 : RS-232C cable for touch panels (5m)

Driver

- IPC-SLIB-01 : Driver & Utility Soft Set(CD-ROM version)

Exclusive option

- IPC-SND-03 : Desk stand
- IPC-POA200/12-01 : +12 VDC output AC power supply
  Input: Voltage = 85 - 264V AC,
  Current = 0.8A (Typ.)
  (for input voltage = 100V AC)
  Current = 0.4A (Typ.)
  (for input voltage = 200V AC)
  Output: Voltage = 12V DC,
  Current = 2.5A
- IPC-ACAP12-01 : +12 VDC output AC adapter
  Input: Voltage = 90 to 264V AC,
  Current = 1.3A (Typ.)
  (for input voltage = 100V AC)
  Output: Voltage = 12V DC,
  Current = 3.5A

Recommendation Cable (Maker: SANWA SUPPLY INC.)

- KC-V2 : RGB display cable(2m)
- KC-V5 : RGB display cable (5m)
- KU20-2H : USB cable for touch panel (2m)
- KU20-5H : USB cable for touch panel (5m)

IPC-DT/M20V(PC)T
IPC-DT/L20S(PC)T
IPC-DT/H20X(PC)T

User's Manual

IPC-DT/20-HMU

CONTEC CO.,LTD.

April 2005 Edition

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Japanese http://www.contec.co.jp/

English http://www.contec.com/

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[02072002] Management No. A-46-563

[04182005_rev5] Parts No. LZN0111